

Disposition to Diseases Among Blacks in the Diaspora **Clayton Bryan B.Pharm, MSc.**

Summary

When Compared to other ethnic groups, epidemiological evidence for blacks who live in the diaspora suggest an increase in prevalence for a number of diseases viz. hypertension, diabetes, prostate cancer, HIV, Trichomoniasis, sickle cell disease and hepatitis C. Besides the genetic predisposition which may be a contributive factor, there are sociodemographic factors such as lower standards of education and income, along with dietary patterns which accentuate the risk within this ethnicity.

Introduction

Peoples of African descent primarily originating from the Sub Sahara, have significant populations in the Caribbean, North and South America, including the United Kingdom. Among this ethnicity, there is an apparent increase in prevalence of hypertension and its' related cardiovascular effects, diabetes, prostate cancer, HIV, Trichomoniasis, sickle cell disease and hepatitis C. This article represents a review of the literature reflecting the predisposition that we are subjected to in the diaspora.

The observed racial disparity for the predisposition to these diseases appears to be genetically based, however, there are lifestyle and sociodemographic factors which need some consideration.

Within the American context, African Americans have a lower dietary potassium intake, significantly lower median income and education, and are less likely to have private group insurance compared with non-African Americans, while a greater proportion are disabled, unemployed, in receipt of Medicaid, unmarried, divorced and separated (Table 1). These social circumstances, lead to a lack of resources, knowledge and access to care, which in turn influence treatment efficacies. ^[1,2,3]

Table 1: Risk Factors Among Blacks in the Diaspora

Increased frequencies	Reduced frequencies
obesity	education
basal metabolic index (BMI)	median income
impaired vascular response	private group insurance

impaired salt excretion	access to health care
salt sensitivity	available resources
disabled	knowledge
unemployed	stop smoking
unmarried	renin
divorced	dietary potassium
separated	
smokers	
medicaid recipients	

Hypertension

Hypertension is a serious issue in black populations as studies reveal that people of African descent in North and South America have higher mean blood pressures and higher rates of hypertension than populations of European descent or populations in Africa. Whether examined within or between populations, there is an interaction between skin color and socioeconomic status (SES) in relation to blood pressure, with persons of dark skin color and low SES having the highest blood pressures.^[4]

33% of adult African Americans are hypertensive, and this ethnicity suffer disproportionately high morbidity and mortality as compared with whites, earlier onset, and possibly more cardiovascular risk factors associated with hypertension than other American ethnic groups.

Also, African American women have a higher body mass index (BMI) and reported higher rates of hypertension, angina, and diabetes.^[1]

Studies of hypertensive pathophysiology in black patients indicate that low renin profiles, salt sensitivity, and impaired salt excretion are more prevalent, while white patients tend toward moderate to high renin levels.^[5]

With respect to antihypertensive therapy, the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC V), advises low doses of a thiazide diuretic as the agent of first choice for hypertensive black patients. When β blockers are used as first-line therapy, they are less predictable than diuretics in black patients, however, labetalol is equally effective in both black and Caucasian populations.

Calcium channel blockers are also an excellent choice for black patients with salt sensitivity, especially those who are not responsive to diuretics.

On the other hand, for those patients who cannot take thiazide diuretics or calcium channel blockers, angiotensin-converting enzyme inhibitors and β blockers may be useful to lower blood pressure, even though studies indicate that these agents may not be quite as effective.

The apparent minimal efficacy observed with nitrates in black Americans is due to an impairment of adequate vasodilation, while there may be an impaired vascular response to the β receptor agonist isoproterenol.

In a prospective study utilizing six categories of antihypertensive agents among black patients, diltiazem produced the best blood pressure control, with a 64% rate of response.

Considering the armamentarium of antihypertensive medications available, most hypertensive black patients will need two or more medications to attain adequate blood pressure control, as only 46% of black patients achieved a diastolic blood pressure <90 mm Hg while on one antihypertensive medication.^[6]

Smoking

One of the risk factors for hypertension is smoking, and data indicates that the rate for inner-city African Americans is higher than in the general population (45% vs. 25%), and they attempt to quit smoking more frequently, but their success rate at quitting is 34% lower.^[5]

Kidney disease

African Americans have a higher risk for chronic kidney disease (CKD), with one study revealing that the incidence being 2.7 times higher than whites. Specifically, middle-aged African-Americans were 4.23 times more likely to develop CKD than their white peers, while among older adults, the risk for African-Americans was 27%. Investigators pointed out that "much of the racial disparity in CKD in the United States is explained by potentially modifiable sociodemographic, lifestyle and clinical factors such as diabetes mellitus and hypertension".^[3]

Vascular nephropathies such as arterionephrosclerosis are a steadily increasing cause of end-stage renal failure, and this is especially true for blacks in whom hypertension and nephrovasculopathies are a major cause of renal insufficiency. There is the consideration that nephroangiosclerosis might stem from a genetic defect in the renal vascular bed and that this defect is strongly associated with the hypertensive trait.^[7]

Diabetes

When compared to Caucasians, African Americans have a higher dietary fat consumption, and obesity is more prevalent in black women as compared to other black or white adults. Hence it is not surprising that among African-American women, diabetes is considered epidemic; the rate is 11.8% among women \geq 20 years of age, and 25% among women > 55 years of age. This is nearly twice the rate of Caucasian women.

In addition, African-Americans experience higher rates of diabetes-related complications, such as nephropathy, lower extremity amputations and retinopathies. The frequency of diabetic retinopathy is 40–50% higher, and end-

stage renal disease is four times more likely among African Americans than Caucasians.

In the United States, people of black African descent with diabetes have 2 to 3 times the amputation risk compared to whites and it is being suggested that this may be due to differences in care or pathophysiological characteristics.^[8]

In the United Kingdom on the other hand, where care delivery is more equitable, diabetes-related amputation rates in African Caribbeans vs Europeans found no ethnic difference among women, but in men, amputation risk was one third that of Europeans. This was wholly accounted for by low smoking, neuropathy, and peripheral vascular disease rates.^[7]

Moreover, the overall mortality rate among African-American diabetic women is 40% higher compared with their Caucasian counterparts.^[8]

Stroke

Individuals of African Caribbean descent who live in the United Kingdom have an increased risk of stroke. The reasons are not fully understood, however, differences in genetic predispositions or other novel stroke risk factors could play a role. One of the possible risk factors could be the increased incidence of common carotid artery wall thickness or intima-media thickness (IMT), which is also found among US blacks.^[9]

When comparing females, African American women have a higher prevalence of stroke, and their life expectancy is 6 years less than white women.^[2]

One study determined the role of prothrombotic polymorphisms in the early onset of arterial Ischemic stroke or cerebral venous thrombosis (CVT) in a group of young Brazilian adults of Caucasian and African descent. Brazilians of African descent demonstrated significant elevations, being 10.3% homozygous for the thermolabile methylenetetrahydrofolate reductase MTHFR-T.^[10]

Prostate Cancer

Considering the distribution of trinucleotide CAG sizes in men from African American ethnic background, whites, or Asians living in Los Angeles County, one study revealed that at any cutoff, African American men had a much higher quantity of androgen receptors with shorter CAG repeats followed by whites, then Asians, in a manner very similar to their relative risk of getting the disease. This CAG repeat translates in a polyglutamine repeat in the protein, and consequently, it is hypothesized that it has an effect in the phenotypic function of the protein.^[11]

While studies have implicated alleles at the CAG and GGC trinucleotide repeats of the androgen receptor gene with high-grade, aggressive prostate cancer disease, little is known about the normal range of variation for these two loci which are separated by about 1.1 kb. Results reveal that populations of African descent possess significantly shorter alleles for the two loci than non-African populations ($P < 0.0001$).^[12]

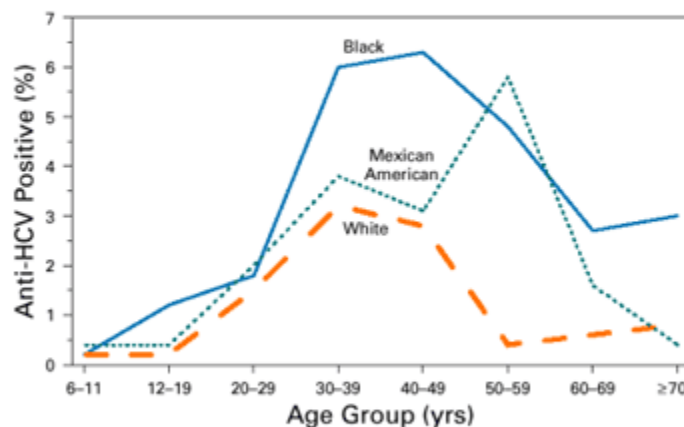
A very high screening-detected prevalence of prostate cancer was obtained in the predominantly Afro-Caribbean population in Tobago. Elevated PSA and/or abnormal DRE were observed in 31% (759 of 2484) overall, and in age groups 40-49 (10%), 50-59 (28%), 60-69 (45%), and 70-79 (64%). 38% of 681 men biopsied, or 10% of the 2484 screened, were diagnosed with prostate cancer. These data support the hypothesis that populations of African descent share genetic and/or lifestyle factors that contribute to their elevated risk for prostate cancer. [13]

There are intra and interracial differences in prostate cancer incidence and mortality rates worldwide, and environment and migration patterns seem to influence the disparities in cancer statistics. The lowest incidence rate is recorded in Chinese, followed by other Asians, South Americans, southern Europeans, and northern Europeans, in ascending order. However, people of African descent have the highest incidence so far. African Americans in Alameda County (California) had incidence rates of (160/1000,000), while 314/100,000 was reported in African Caribbeans from Jamaica. [12]

Hepatitis C

Hepatitis C infection is the most common cause of chronic liver disease and is the most common indication for liver transplantation. Serious sequelae of hepatitis C infection include cirrhosis, liver failure, and hepatocellular carcinoma. In the United States, 40% of chronic liver disease is related to hepatitis C, and while the highest rate is in persons aged 30-49 years, hepatitis C is more prevalent in blacks than in other racial groups. (Figure 1) [14]

Prevalence of HCV Infection by Age and Race/Ethnicity in the United States, 1988–1994



Centers for Disease Control and Prevention. *MMWR Recomm Rep.* 1998;47(No. RR-19):1-39.

Figure 1. Prevalence of HCV infection by age and race/ethnicity in the United States, 1988-1994. HCV, hepatitis C. Centers for Disease Control and Prevention. *MMWR Recomm Rep.* 1998;47(No. RR-19):1-39.

HIV and Trichomoniasis

African-Americans make up just 12% of the population in the United States, but they account for an estimated 54% of all new HIV infections. Among African-Americans, young women, gay and bisexual men are at greatest risk of HIV infection. ^[15]

In many jurisdictions in the United States, HIV is increasingly affecting low-income groups, particularly African-Americans and women. In fact, the Center for Disease Control (CDC) estimates that of all new HIV infections in women, 64% are among African-American women, and it has hypothesized that part of this phenomenon may result from the amplifying effect of *T. vaginalis*.

The available data suggest that *T. vaginalis* is a highly prevalent infection, and for each study that has presented information on ethnicity, the prevalence of *Trichomonas* has been highest in African-Americans (23%-51%), ranging from approximately 1.5 to nearly 4 times greater than other ethnic groups. In several studies in which very high prevalences of infection were observed, the population consisted exclusively or predominantly of African-Americans.

The apparent elevated rate of trichomoniasis in black women may be indicative of a high prevalence of *Trichomonas* infection among their sex partners, and lower use of condoms because of a higher frequency of condom breakage and slippage.

Drug use, its association with high-risk sexual behaviors, including trading sex for money or drugs, along with douching, which is reportedly more common in black women, (which can increase susceptibility to other STIs), could predispose to trichomoniasis and explain the observed racial association.

It could also reflect lack of access to care and distrust of the health-care system, which could manifest as failure to seek care, noncompliance with treatment recommendations, and hesitation to refer partners for treatment. ^[16]

Sickle Cell Disease

Sickle cell disease is a recessively inherited condition in which synthesis of haemoglobin is abnormal. The disease, which occurs mainly in people of African, African-Caribbean, Indian, Mediterranean and Middle Eastern descent, is characterised by chronic anaemia, susceptibility to infection, bouts of severe pain and organ dysfunction. ^[17]

Homozygous sickle cell anaemia (Hb S) is the most common major haemoglobinopathy in the United States, occurring in approximately 1 in 626 African Americans. ^[18]

Systemic Lupus Erythematosus (SLE)

SLE has a high prevalence in Afro-Caribbean populations. The prevalence of SLE in women in an area of south London was estimated it to be 177/100000 (95% CI 135-220) in Afro-Caribbeans, 110 (58-63) in West Africans, and 35 (26-43) in Europeans, suggesting a genetic predisposition. ^[19]

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